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ENTOMOLOGICAL NEWS

VOL. XLVII. MARCH, 1936 No. 3

At the International Congresses of Entomology and Zoology, of 1935.

By J. CHESTER BRADLEY, Cornell University, Ithaca, New York.

(Continued from page 34.)

The long-protracted journey to Lisbon no one enjoyed, for it was beset with many difficulties in the way of poor connections, crowded accommodations, even a five-hour wait at a wayside station in Portugal. But these things seem normal to Iberian railroading and eventually they were of the past, and we were comfortably at home in a hotel in Lisbon, late Saturday evening.

Lisbon, like Rome, is a city built upon hills. The commercial center, in which our hotel was located, is in a valley at water-level. The hills and streets lead sharply upward on either side, and the heights are also reached by various elevators and short cable-car lines. The Faculty of Sciences of the University, formerly known as the Polytechnic College, is housed on one of these hills, and served as headquarters of the Zoological Congress. The dreary buildings, erected in 1844, contrasted unfavorably with the beautiful structures in which the sessions of the Entomological Congress had been held.

On Sunday morning the opening formal session of the Congress was held in the hall of the Geographical Society. The President of the Republic presided and several addresses were delivered, but the acoustics of the hall were such that few could hear what was being said. In the afternoon we were taken for a drive through Lisbon in a long procession of taxi-cabs. The most characteristic and pleasing feature of Lisbon is the tiled exteriors of the houses, both residences and commercial buildings, in never ending design and many colors. This is of course the result of Moorish influence. Coming to the summit of one of the hills, the procession halted at a "mirador," liter-

ally "gazing-place." We all got out of our taxis, strolled about and enjoyed the lovely panorama of city, hills and Tagus. Also we visited a very ancient tiny chapel which was there. The drive was followed by a reception at the Ministry of Public Instruction. It was interesting to compare the technique of the Portuguese buffet with the Spanish. But it is beyond possibility to describe the great variety of delicious things that were provided for our delectation at this and many more such events to come. At half-past nine in the evening there was a performance for us, at one of the theatres, described as an "Artistic Night Entertainment upon Portuguese Motives." It was very enjoyable.

General sessions of the Congress were held on Monday, Wednesday and Friday mornings and at 9:30 on two evenings. From which one will see that in Lisbon, as in Madrid, night is a time for activity. Sectional meetings were held on two mornings and three afternoons. There were few papers on entomology in the section devoted to that subject, but several read in other sections. In all there were twelve sections.

Late on Monday afternoon we were taken for a boat ride on the Tagus. Many students from the Medical College took a very enthusiastic share in the excursions, and a number of these organized some lively dancing on this steamer.

Tuesday, after ferrying across the Tagus, we had an interesting excursion by autobus to Setubal lasting all afternoon. Near Palmella we climbed to the imposing ruins of an ancient castle. Nearby were three white-washed windmills, the first we had seen, the wheels with their sail-like arms, turning lazily in the breeze. A lovely drive along the coast brought us to a fishing village, where we visited a sardine-canning factory. Everything within was very clean and sanitary. After a further drive we came to a fortress-like building, the ramparts of which rose from rocks over the sea. It was a former monastery, now turned into a hospital for consumptives. We entered a court overlooking the sea, where long tables were spread with the usual diversity of delicacies for a feast.

Thursday we were taken for an all day excursion by taxis. First we visited the old royal monastery of Mafra. Afterwards we visited the lovely grounds of a private estate, where large tree-ferns, and many kinds of tropical plants and trees were under cultivation. At Cintra we were guests of the municipality at a long-drawn-out luncheon. Then we were driven up a wooded hillside on the summit of which was a beautiful, but not ancient castle, built in Moorish style. Leaving this we wound down through a labyrinth of roads among pleasant woodlands, until we reached a small rustic forestry station and museum, on the lawn of which we were served with another picnic of Portuguese delicacies. Eventually we drove to Estoril, a seaside resort, where in a very fashionable and modernistic casino we were guests of the President of the Congress at an elaborate and delicious banquet. This was followed by an "Artistic fest" and lasted very late into the night.

During the week the International Commission on Zoological Nomenclature held frequent sessions. Among other matters they acted upon recommendations that had been received from the Committee on Entomological Nomenclature which had held sessions during the Congress in Madrid. Of the measures enacted of interest to entomologists were several cases in which the rules were suspended and types fixed to conserve certain generic names of Orthoptera, of butterflies and of Hymenoptera. The latter involves family and subfamily names, and now permit the retention of Cimbicidae, Crabronidae, Ichneumoninae, Pimplinae, Braconinae, Proctotrypidae, Prosopidae, Bethylidae, Sphecinae, Ammophilinae, Pompilidae and others in their old usage.

There were over 380 registrations at the Zoological Congress, and about 430 at the Entomological. But each of these figures included a good many persons who registered but did not attend, and institutions which became corporate members.

The final meetings of the Zoological Congress and the closing banquet were held on Saturday, but we did not stay for them. Instead we took the tri-weekly train for Villa Real de San Antonio, from which point we ferried across the river to

Spain and took an auto to Seville. After a couple of days in that incomparable city, enjoying, despite suffocating heat, the contrast between northern Spain and Audalusia, and after a couple of pleasantly cool days on the sea at Cadiz, we took an autobus over the hills to Gibraltar. On the evening of the 27th we were ready and waiting to board the Conte di Savoia, as she came steaming into the harbour, every light blazing, and towering above our tender like a scintillating mountain.

The Immature Form of Brachymesia gravida, with Notes on the Taxonomy of the Group (Odonata: Libellulidae).

By C. Francis Byers.

(Continued from page 37)

Because of the new material presented in Dr. Klot's work, indicated above, and the present writing, the author thinks it advisible to construct a key to the genera of the American Libellulid nymphs. At present the better available keys [4] are to the fauna of a restricted geographical area and the more general keys are inadequate. In the following key those genera described on supposition by Dr. Klots are indicated by placing the generic name in quotation marks.

Key to the American Genera of Anisopterous Dragonfly Nymphs Possessing a Labium in the Form of a Mask.

(Corduliinae and Libellulinae.)

1—Head with a prominent frontal horn between the bases of the antennae .....[Macromiini]
Head without a prominent frontal horn..... (2)
2—Abdomen with dorsal hooks present..... (3)
Abdomen with *no* dorsal hooks present.....(21)
3—A dorsal hook present on abdominal segment 9..... (4)
A dorsal hook *absent* on abdominal segment 9..... (14)
4—Lateral spines of segment 9 attaining or surpassing the tips of the abdominal appendages..... (5)
Lateral spines of segment 9 not attaining the apex of abdominal appendages ..... (7)

[4] From which I have freely drawn for the material in the present key and to whose authors I am thus indebted.

5—Lateral spines of segment 8 set at an angle to the long axis of the abdomen, not parallel to those of segment 9. Lateral labial setae 5-6; mental 7-11. Length 21 mm. ..... *Neurocordulia*

Lateral spines of segment 8 not set at an angle, and parallel to those of segment 9 ..... (6)

6—Lateral labial setae 4-5; mental, 4. Mentum about as long as wide. Length, 27 mm. ..... *Epicordulia*

Lateral labial setae 6-8; mental, 9-10. Mentum longer than wide. Length, about 16 mm. ..... *Tetragoneuria*

7—Superior and inferior abdominal appendages long; as long as the mid-dorsal length of abdominal segments 8 + 9 ..... (8)

Superior and inferior abdominal appendages short; not as long as the mid-dorsal length of segments 8 + 9 ..... (9)

8—Lateral labial setae 8; mental 9 ..... *"Miathyria"*

Lateral labial setae 6; mental 8..... *Brachymesia*

9—Mental setae 8-9. Dorsal hooks small and blunt. Crenulations of lateral lobes of the labium high... (10)

Mental setae 10-14. Dorsal hooks sharp and slender. (11)

10—Lateral labial setae 6; mental 8..... *"Macrothemis"*

Lateral labial setae 7; mental setae 9-10..... *"Scapanea"*

11—Lateral abdominal appendages nearly as long as the superior ..... (12)

Lateral abdominal appendages usually not over half as long as the superior ..... (13)

12—Crenulations of the lateral lobes of the labium low. Dorsal hooks absent on abdominal segments 3-4. Lateral spines on abdominal segment 9 approximately as long as the dorsum of the same segment. Length 15-20 mm. ..... *Helocordulia*

Crenulations of the lateral lobes of the labium high. Dorsal hooks present on abdominal segments 3-4. Lateral spines on abdominal segment 9 not more, usually much less, than the length of the same segment. Length 18-27 mm. ..... *Somatochlora*

13—Length of the lateral labial lobes measured from the base of the movable hook to the lateral point of articulation with the mentum longer than the distance from this point of articulation to the base of the mentum. Lateral labial setae 5. Length 15 mm. ..... *Perithemis*

Length of the lateral labial lobes as measured above shorter than the mentum. Lateral labial setae 7-10. Length about 20 mm. ..... *"Dythemis"*

14—Eyes at side of head (lateral) .....(15)
Eyes capping the anterolateral angles of the head; more frontal than lateral .....(18)
15—Lateral abdominal appendages nearly as long as the inferiors. Lateral labial setae 7 .....*Dorocordulia*
Lateral abdominal appendages usually about half the length of the inferiors. Lateral labial setae 9-14..(16)
16—Dorsal abdominal hooks usually as long as the segments bearing them. A dorsal hook on abdominal segment 3 in most species. Inferior abdominal appendages not or but slightly longer than the superior .....*Leucorrhinia*
Dorsal abdominal hooks shorter than the segments bearing them. Without a hook on abdominal segment 3. Inferior abdominal appendages markedly longer than the superior .....(17)
17—Lateral abdominal spines long and straight, those of 9 extending to the tips of the inferior appendages or beyond .....*Celithemis*
Lateral abdominal appendages shorter and incurved. *Sympetrum*
18—Mental labial setae 0-4 .....*Ladona*
Mental labial setae 8-15 .....(19)
19—Body smooth. Low dorsal hooks on abdominal segments 2-6. Crenulations of lateral lobes of the labium very deep. Mental labial setae 14-15. [Distribution: SW. States, Tex., Mex. to Brazil]. *Paltothemis*
Body hairy. Dorsal hooks on abdominal segments 3-6 or 8. Crenulations of lateral lobes moderate. Mental labial setae 8-13. [Distribution not as above.] .....(20)
20—Median lobe of the labium evenly contoured.....*Libellula*
Median lobe of the labium crenulate on the front border .....*Plathemis*
21—Inferior abdominal appendages strongly decurved...(22)
Inferior abdominal appendages straight.....(23)
22—Lateral labial setae 11-12.....*Lepthemis*
Lateral labial setae 8-9 .....(*Mesothemis*) *Erythemis*
23—Eyes capping the anterolateral angles of the head (frontal), usually small and not very prominent..(24)
Eyes at the side of the head (lateral), usually large and prominent .....(26)
24—Lateral abdominal appendages nearly as long as the superior. Length of abdominal segment 10 + ap-

pendages shorter than the length of segment 9 measured on the mid-ventral line. Crenulations of the lateral lobes of the labium high.....*Somatochlora*

Lateral abdominal appendages one-third to one-half as long as the superior. Length of abdominal segment 10 + appendages longer than segment 9 measured on the mid-ventral line. Crenulations of the lateral lobes of the labium shallow.....(25)

25—Median lobe of the labium evenly contoured...*Libellula*

Median lobe of the labium crenulate on the front border .....*Orthemis*

26—Abdominal appendages long, slender and needle-pointed. Lateral spines of segments 8 and 9 long and incurved. Those on 8 at least as long as the lateral margin of segment 9.....(27)

Abdominal appendages short and heavy, not projected into a long needle-point. Lateral spines on segments 8 and 9 flat and straight. Those on 8 not as long as the margin of segment 9.....(28)

27—Lateral spines on abdominal segment 9 as long as the inferior abdominal appendages. Crenulations of the lateral labial lobes obsolete .....*Tramea*

Lateral spines of abdominal segment 9 not as long as the inferior abdominal appendages, about as long as the laterals. Crenulations of the lateral labial lobes deep .....*Pantala*

28—Lateral abdominal appendages more than half as long as the inferior (three-fourths to as long usually). Lateral labial setae 6-7 .....(29)

Lateral abdominal appendages less than one-half the length of the inferior (one-third to one-half). Lateral labial setae 9-14 .....(30)

29—Inferior abdominal appendages as long as the superior. Lateral labial setae 6. Length 10 mm. *Nannothemis*

Inferior abdominal appendages longer than the superior. Lateral labial setae 7. Length greater than 15 mm. (usually 18-19 mm.) .....*Cordulia*

30—Lateral spines present on abdominal segment 8.....(31)

Lateral spines lacking on abdominal segment 8, rudimentary on 9 .....*Sympetrum*

31—Lateral spines of abdominal segment 8 short; of 9 long. The lateral spines of 9 as long as the abdominal appendages, longer than the margin of segment 9 .....*Pachydiplax*

Lateral spines of abdominal segments 8 and 9 more nearly the same length. Those of segment 9 less in length than the margin of segment 9.....(32)

32—Distribution Northern: Me., Wisc.; Hudson's Bay to B. C. and Alaska .....(33)
Distribution Southern: Tropics and Gulf Strip; S. E. States, Tex.; W. Ind.; Mex. to Argentine. *Erythrodiplax "Micrathyria"*

33—Prominent bunches of setae present on the dorsum of abdominal segments 4-9 .....*Erythrodiplax*
No such arrangement of setae on the abdomen. *Leucorrhinia*

Unknown Genera: [*Platycordulia, Williamsonia, Pseudoleon, Uracis, Macrodiplax, Tauriphila, Ephidatia, Brechmorhoga*].

A Summary of Insects Attracted to Liquid Baits.[1]

By S. W. Frost, The Pennsylvania State College.

During 1933 and 1934, seventy-five attrahents were used to attract oriental fruit moths in a peach orchard interplanted with apple trees in Adams County, Pennsylvania. Each experiment consisted of ten traps. The tests were repeated four times during the summer, covering a period of twenty-one weeks, except in a few cases where materials were not attractive. A mixture of one part refiner's syrup and twenty parts water was placed in all traps, with chemicals added at the rate of one cubic centimeter, or one gram, per trap. Most of the acids were soluble in the baits. Cinnamic, camphoric and picric acids and borneol were dissolved in alcohol before adding them to the mixture. Methyl cinnamate, piperonal and thymol were dissolved in warm mineral oil and then emulsified. These and all other chemicals were emulsified with 3 grams of number 235 American Cyanamid spreader, 30 cc. of water and 10 grams or 10 cc. of the attrahent. This made sufficient bait for ten traps. A record was kept of insects that visited the baits. Since reports have been published on many of these, the present paper is concerned primarily with miscellaneous insects

[1] Publication authorized by the Director of The Pennsylania Agricultural Experiment Station, November 6, 1934, as Technical Paper No. 664.

which have been taken in relatively large numbers, and may prove of value to other workers.

DIPTERA.

Tabanidae were captured in relatively large numbers. About seventy-five percent of the catches were females. This was rather surprising as the females are largely blood feeders. Seven species of *Tabanus* were taken: *T. lasiophthalmus* Macq., during May and June; *T. atratus* Fab., from June 11 to September, 13; *T. sulcifrons* Macq., during July and August; *T. giganteus* De Geer, chiefly during late September and early October; and occasional specimens of *T. nigrescens* P. B., *T. lineola* Fab. and *T. costalis* Wied. A few incidental captures of *Chrysops* were made. Dr. J. S. Hine checked the identification of these species for the writer. Soap, sodium oleate, camphoric and oleic acids were outstanding attrahents.

Reports on Ortalidae have been published heretofore.[2] During 1933, notes were taken on three species: *Euxesta notata; Pseudotephritis vau;* and *Callopistromyia annulipes.* These are grouped in the following table. Sweet baits, such as amyl acetate and syrup, were most attractive. Acids were generally unattractive, although citric and malic acids caught comparatively large numbers.

Judging from the comparatively small numbers taken in traps, Syrphidae are not attracted but are probably chance catches. On the other hand, a remarkable number of species were taken. These include *Volucella vesiculosa* Fab., *Ferdinandea dives* O. S., *Syrphus ribesii* Linn., *Mesogramma marginata* Say., *M. polita* Say, *Tenthredomyia abbreviata* Loew, *Spilomyia hamifera* Loew, *Criorhina decora* Macq., *Ceriodes willistonii* Kobl, *C. signifera* Loew, *Chrysogaster nitida* Wied., *Sphaerophora cylindrica* Say, *Platychirus erraticus* Curran, *Milesia virginiensis* Drury, *Mallota posticata* Fab., *Syritta pipiens L.*, and *Didea fasciata* Macq. The above determinations were made by Mr. R. C. Shannon and Mr. C. G. Green through the cour-

[2] Notes on Ortalidae. ENT. NEWS 30, No. 6: 169-172, 1928. Notes on Pennsylvania Ortalidae. ENT. NEWS 40: 84-87, 1929.

tesy of the late Dr. J. M. Aldrich of the United States National Museum. *Ferdinandea dives* and *Syrphus ribesii* were the common captures during May, while *Volucella vesiculosa* and *Mesogramma marginata* were the common species taken during June, July and August. They show a preference, if any, for the sweet baits.

At least a dozen species of Stratiomyidae were taken in baits. These have not been determined but are preserved for future study.

Bibio femoratus Wied. came to baits in large numbers from May 2 to June 16, 1933; 513 specimens were captured. There seemed to be little difference in the attractiveness of the various baits. Baffles increased the catches considerably.

Twelve specimens of the rare *Onocodes incultus* O. S., were taken from one set of traps on June 15.

Other Diptera were taken in large numbers. *Anisopus* was exceedingly abundant, especially during April, although specimens were taken in May, June and July. Drosophilidae, Muscidae, Tabanidae and Anthomyiidae were attracted in liberal numbers.

LEPIDOPTERA.

During 1934, an attempt was made to skim certain moths, other than the oriental fruit moth, from the surface of the baits. The codling moth, *Carpocapsa pomonella* Clem., the bud-moths, *Sparganothis idaeusalis* Walk. and *Spilonota ocellana* D. & S., and the leaf-rollers, *Eulia velutinana* Walk., *Archips argyrospila* Walk., and *A. rosaceana* Harris, were taken in comparatively small numbers. These insects were probably not abundant in the twelve-year-old orchard where the work was conducted, but it is suspected that bud-moths and leaf-rollers might respond freely to some baits.

The peach borer is not readily attracted to baits, and as a rule, only the males respond to the stimulus. Adults were trapped earlier in the season than previous records indicate that they fly. One male was captured the week of May 24 to 31. Four specimens were taken during the week of May 31 to June 6. It is possible that a bait may be discovered that will be useful in determining the flight periods of this moth.

Synanthedon scitula Harris, the larva of which feeds in the galls of various trees, was taken in rather striking numbers during June. A few were captured earlier than this, and some during July, but none after August 8. Sweet baits were most attractive. Acids, with the exception of citric, malic, tartaric and succinic, were unattractive.

Noctuîdae rank next in numbers to the oriental fruit moth, and are generally attracted by the same type of baits. There is at least one exception. Terpinyl acetate is highly attractive to the oriental fruit moth but not strongly attractive to the Noctuidae.

Although many other moths were captured it was difficult to make determinations because the bait destroyed essential characters. *Eustrotia carneola* Guenee, however, was a conspicuous visitor.

HYMENOPTERA.

Parasitic insects are a minor factor in the operation of baits and have never been taken in appreciable numbers. During 1933, only thirty specimens of *Glypta rufiscutellaris* and *Macrocentrus ancylivora* were captured in 400 traps operating over a period of twenty-one weeks. Other parasitic forms were rare visitors.

Honey bees are not strongly attracted to syrup or aromatic baits. Citral and anethol were the only materials that attracted a noticeable number.

Several species of Vespidae were taken in baits but were apparently not attracted. The species taken were *V. diabolica* Sauss, *V. maculata* L., *V. crabro* L., and *V. maculifrons* Buy.

Polistes pallipes Lep. was captured in moderate numbers chiefly in late June and early July.

Other Hymenoptera were captured but the magnitude of the problem prohibited accurate records. Ants, of course, were taken in great numbers. Tenthredinidae were frequent visitors. Mutillidae, Chrysididae, Ichneumonidae and Chalcididae were taken rarely. *Monobia quadridens* and *Sphecius speciosus* were seen quite frequently in baits.

COLEOPTERA.

Glischrochilus fasciatus (Oliv.), a natural sap-feeder, was taken in moderate to large numbers from April 25 to September 25, but the catches were noticeably reduced during August and September. It was attracted by sweet baits, particularly syrup and water. The addition of soap and sodium oleate increased the catches. Amyl acetate and anethol were especially alluring. Acids, on the whole, were not attractive, although tartaric, acetic and formic acids caught many of these beetles. Cinnamic acid was decidedly repulsive.

Elateridae, chiefly species of *Melanotus,* were captured largely during June. Although 158 specimens were taken during 1934, it is probable that they were attracted not by the baits but, having the habits of visiting peach and apple, accidentally tumbled into the traps.

Cerambycidae came to the traps freely, especially when they were placed in or near wooded areas. During 1933 and 1934 the traps were not located near woodlands and the catches were comparatively small. The addition of sodium arsenite to the syrup seemed to increase the catches considerably.

Euphoria inda, as might be expected, was taken chiefly in June, although some were captured in July, August and September. Sweet baits, amyl acetate and plain syrup, were most attractive. Acids were decidedly unattractive.

Lachnosternae were numerous when traps are placed in the vicinity of wooded areas. The traps used were placed in a peach orchard, and only 215 specimens were taken during 1933.

The plum curculio, *Conotrachelus nenuphar* (Hbst.), is not attracted to baits, but occasionally falls in the traps when the trees are jarred.

Other Coleoptera have been taken in great abundance and data are reported in a previous paper.[3]

(To be continued)

[3] Coleoptera taken from Bait Traps. Ann. Amer. Ent. Soc. 22: 427-437, 1929.

The Mantispidae of the Douglas Lake, Michigan Region, With Some Biological Observations (Neurop.)[1].

By H. B. HUNGERFORD, Lawrence, Kansas.

(Plate I in the April number)

The Mantispidae have been rare, or at least uncommon, insects wherever I have collected. Certainly the general collector would take them only occasionally and the capture of one of these curious mantis-like neuropterons would be a noteworthy surprise.

Until the summer of 1934, only four specimens had been taken in the Douglas Lake, Michigan, region in ten seasons' collecting. The University of Michigan Biological Station is located on Douglas Lake where I have conducted a class in entomology each season. Since there have been from 20 to 30 students each summer, most of them graduate students and all required to make extensive general collections of insects, I must say that Mantispids in that region are seldom taken by sweeping and such methods usually employed by the general collector. However, during the season of 1934, there were either larger numbers of *Mantispa* present or we have hit upon a more productive method of searching for them. I am inclined to believe that the latter is responsible for the fact that we secured 26 specimens of *Mantispa interrupta* Say during the summer.

Miss Janet Wilder, a graduate student from Mount Holyoke College, deserves the credit for discovering where and how to look for this species. She brought a pinned specimen to the first class meeting and when I expressed my desire to secure living specimens for study, she brought in several live specimens together with field notes concerning them. During the session she gave me eleven live specimens which she obtained by searching especially for them. Not one of the other twenty-six students secured a specimen by this method, although they were told how to look for them. Two females were captured at the arc light one night and I took eleven specimens by diligent search for them. We found 22 specimens on red oak

[1] Contribution from University of Michigan Biological Station.

(*Quercus rubra borealis*) where they were resting on the foliage or twigs. While we searched quite as diligently, the maples and other trees, we found only two specimens on maple and one of the maples was intertwined with an oak. Since the insect is a predaceous one, it is difficult to account for its preference for the oaks. The oaks were infested with *Kermes* scales which were attended by ants and in one case, a Mantisipid was devouring an ant. However, in the cages no preference for ants was shown and flies appeared to be the most acceptable food, although they captured other insects including adult Myrmeleonids. They did not like Mirids and other bugs. The specimens were placed in laboratory cages, either alone or in pairs. Sometimes pairs lived together for weeks. In two cases the females ate their mates and in one case a male devoured the female.

They do very well in confinement if given a few drops of water each day and a housefly or other insect for food. Living insects will be accepted from the tweezers, or they will be captured when liberated in the cage. One female *Mantispa interrupta* Say, captured July 19 at the light, lived 67 days and was transported from Michigan to Kansas without difficulty and without interference with her egg-laying activity. She laid nine batches of eggs on different dates as follows: July 24, 1269 eggs; August 2, 2348 eggs; August 11, 1329 eggs; August 14, 1385 eggs; August 26, 652 eggs and 345 eggs; September 1, 180 eggs; September 13, 413 eggs and September 21, 464 eggs. She died on September 24th after depositing in captivity 8385 eggs! Another female kept 52 days laid 6262 eggs, another 49 days laid 6850 eggs, another 42 days laid 5222 eggs, another 23 days laid 3464, and two others deposited more than 2000 eggs each. Ten of the twelve females deposited eggs in captivity.

The above figures are interesting since, until recently, our knowledge was based on observations of European workers who reported that *Mantispa styriaca* Poda laid "many eggs." Just recently, indeed since my observations were made, Dr. R. C. Smith in the October (1934) Journal of the Kansas Entomological Society has given us our first definite idea con-

cerning the reprductive capacity of a Mantispid species. He reports some 2200 eggs for a female of *Mantispa sayi* Banks. It is by no means certain that 2200 eggs for *Mantispa sayi* Banks or 8385 eggs [2] for *Mantispa interrupta* Say represent the biotic potential of these species. The figures do suggest, however, the hazards that these uncommon insects encounter in their development.

Until this year (1934) it has been necessary for our American text books to quote Friedrich Brauer's observations on *Mantispa styriaca* Poda published in 1869. He described the eggs of this European species and reported that the larvae over wintered and in the following spring entered the egg cocoons of certain spiders such as *Arctosa allodroma, Lycosa inquilina* and *Dolomedes*. Poujade (1898) added *Drassodes hypocrita* E. Sim. and Main (1931) a Drassid Spider as host. The last-named author secured the emergence of adults in July which deposited a large number of eggs at the end of August. This suggests a long preoviposition period. Mr. Main also observed that the males possess an extrusible organ on the dorsal surface of the abdomen. This was investigated histologically the following year by Dr. Eltringham. Prior to Dr. Smith's paper no information concerning the development of any American species of the genus *Mantispa* was known.

Dr. Hine (1902) reported the collection of *Mantispa interrupta* Say at Vinton, Ohio, June 10, 1900. This was reported to be a male taken from the trunk of a small tree. On June 20, 1901, Mr. Morse took what was reported to be a female at the same place by beating oak foliage. Dr. Hine also stated that "In comparison, the general coloration of the body of the female is lighter than the male." In all the specimens I have seen the reverse is true. The male abdomen is gray with a dark longtitudinal band above and below, while that of the female is cinnamon brown particularly beneath. The last

[2] The female that deposited 8385 eggs was taken July 19th and began laying eggs in captivity July 24th. Since we had captured 16 specimens before July 19th and the first female taken on June 26th began oviposition on July 3rd, it is quite possible that this one taken July 19th had already deposited eggs before she was captured.

visible abdominal sternite of the female is broad and large while in the male it is small. Of course, the male has a pair of claspers equipped with hooks that show in relaxed specimens. Furthermore, I cannot agree with Dr. Hine's description of the wings. Perhaps he had some *Mantispa sayi* Banks in the lot.[3]

Dr. Smith (1934) records some biological data regarding three species in Kansas, namely *Mantispa sayi* Banks, *Mantispa interrupta* Say and *Climaciella brunnea* (Say).[4] He described the egg stage and the hatching of *M. sayi* Banks and found the incubation period to be from 9 to 11 days. The larvae all died in a few days, refusing to enter spider egg sacs. He also described the egg of *Climaciella brunnea* (Say) which had an incubation period of 11 days. While he did not describe the eggs of *Mantispa interrupta* Say, he published a photograph of an egg batch that was deposited by an adult taken October 8 and, moreover, secured the emergence of two pupae from egg sacs gathered in the field and believed to be those of *Philaeus militaris* Htz., a jumping spider. These pupae emerged on the 10th and 13th of October. This information as to the host of *Mantispa interrupta* (Say) is most welcome and timely, since I have 36,895 larvae in winter storage, some of which, I hope, will be available for life history studies in the spring.[5] It seems likely that with a host spider known, it will be easy enough to follow the larval and pupal development if the minute larvae can be wintered successfully. There are points also concerning mating and oviposition that need further study.

(To be continued.)

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[3] Recently Dr. R. H. Beamer examined the Mantispas mentioned above and reports: Specimen labeled "Vinton, Ohio, June 10, 1900," is *M. interrupta* Say; the one "Vinton, Ohio, Morse, June 20, 1901," is *M. sayi*, Banks ♀; the one "Sandusky, Ohio, Osborn," is *M. sayi* Banks ♂. Thus Dr. Hine did have two species before him.

[4] Described by Say as *Mantispa brunnea* but Enderlein (1910), made it the type species of his new genus *Climaciella*, a name which Dr. Banks (1912), recognized.

[5] While Brauer's species wintered in the first larval stage, Smith's observation indicates the possibility of our *Mantispa* wintering as adults also. This is supported by Kuwayama,[6] who took *M. formosana* Okamoto in February, March, and through the summer to October, and Nakahara[7] obtained *Climaciella magna* (Mikaye) April to October.

Five New Southwestern Coleoptera (Buprestidae and Cerambycidae).

By J. N. KNULL, Ohio State University, Columbus, Ohio.

Acmaeodera uvaldensis n sp. (Buprestidae).

Elytra moderately convex dorsally, nearly straight ventrally, aeneous above and beneath with brownish tinge, each elytron with irregular yellow markings as follows: four along side starting back of humeral angle, four on disk starting in line with first, two lateral apical red spots.

Head flat, coarsely punctate, clothed with long white pubescence; antennae serrate from the fifth joint.

Pronotum twice as wide as long, wider in the rear than in front, widest in the middle; side margins well indicated in front, inferior toward base; disk convex, shallow depression in front of scutellum, a prominent crescent-shaped depression on each side at base; surface evenly punctate in center, punctures much larger and more numerous laterally, clothed with long white pubescence along sides.

Elytra moderately convex, slightly wider than base of pronotum; sides sinuate back of humeral angles, expanded back of middle, acutely attenuate at tips, which are acute, margins coarsely serrate; disk convex, humeri elevated; surface striato-punctate, punctures large, confluent, intervals wider than punctures, with single rows of much finer punctures, pubescence long.

Abdomen beneath coarsely punctured, white pubescence dense; last ventral segment broadly rounded with a distinct subapical carina; anterior margin of prosternum sinuate, with a distinct tooth on each side of the middle.

Length 9 mm.; width 3 mm.

Described from a single specimen collected at Uvdale, TEXAS, May 21, 1935, by the author. *Holotype* in my collection.

According to Fall's key,[1] this species would run to *A. fenyesi* Fall, but it can be separated by the lack of the subapical plate on the abdomen and shape of pronotum. It is closely related to *A. purshiae* Fishr., but the markings on the elytra will serve to distinguish the two species.

Xenorhipis osborni n. sp. (Buprestidae).

Form similar to *X. brendeli* Lec., size smaller.

♂.—Head convex, slight depression on front near vertex;

[1] H. C. Fall. Jour. N. Y. Ent. Soc., 7, p. 5, 1899.

surface crenulate; color dark blue; eyes small, finely granulate; antennae dull testaceous, extending to middle of elytra when laid along under side of pronotum, flabellate, quite similar to that of *X. brendeli* Lec. figured by Horn,[2] rami beginning at the second joint.

Pronotum one-and-one-half times as wide as long; anterior margin slightly sinuate, median lobe broadly rounded; base deeply emarginate at middle of each elytron; disk convex, slight depression in front of scutellum; lateral margins inferior in front, present on basal third only; sides nearly parallel, slightly rounded anteriorly, sinuate near base; surface crenulate; color bright metallic blue in middle; bright cupreous along sides. Scutellum oval, granulate, dark blue.

Elytra not quite as wide as pronotum at base, not covering the abdomen but extending to end of third abdominal segment, nearly twice as long as wide; sides parallel anteriorly, sinuate back of middle, apices broadly rounded; side margins serrulate on apical third; disk impressed on white fasciae; surface of white area densely punctate, dark area roughly, asperately punctate; color bright metallic green at base and in region of scutellum, a white fascia on each elytron extending from side margin nearly to suture in middle, anterior portion extending diagonally from sutural to humeral region, rest of elytra piceous; under wings visible, extending to slightly beyond tip of abdomen.

Beneath bright blue; abdomen coarsely, asperately punctate; legs piceus; sides of metasternum with a large, hairy depression, or excavation.

Length 5.5 mm.; width 1.5 mm.

♀.—Differs from the male in having normal antennae, extending slightly behind humeral angles when laid along under side of pronotum, serrate from the fourth joint; eyes slightly smaller, front bright metallic blue.

Pronotum bright metallic green along sides, anterior and basal margins, central area dark blue.

Elytra less strongly sculptured in dark areas, extending to end of fourth abdominal segment; each elytron with a median transverse white fascia extending from lateral margin nearly to suture, a broad transverse bright metallic green area at base, extending along suture, another at apex, rest of elytron piceous; dorsal surface of abdomen bright metallic green.

[2] G. H. Horn, Trans. Amer. Ent. Soc., 10, p. 165, 1882.

Ventral surface and legs dark blue; sides of meso- and metasternum bright metallic green; depression of metasternum lacking; abdominal punctures light.

Length 5 mm.; width 1.5 mm.

Described from a small series of both sexes collected by the writer on dying cat's claw (*Acacia constricta* Benth.) in the Davis Mountains, TEXAS, May 24 to 27, 1935. The females were extremely active in the bright sunshine.

Holotype male, *allotype* female and *paratypes* in writer's collection, *paratype* in collection of Ohio State University.

It gives me pleasure to name this interesting species after Professor Herbert Osborn. This insect appears to be a connecting link between *Xenorhipis* and *Hesperorhipis* described by Fall [3] and it possesses certain characters which will fit either genus. However the antennae of the male agree with those of *Xenorhipis* and I have placed it provisionally in this genus.

Agrilus parkeri Knull (Buprestidae).

Mr. Parker has called my attention to the fact that the type material of this species was collected in June, instead of July as I stated.[4]

(To be continued.)

WARD'S ENTOMOLOGICAL BULLETIN. Vol. 3, No. 3. January, 1936. We find in this number; notes on the "twisted winged insects (Stylopidae)"; on a collecting expedition down the coast of Florida by S. C. Bishop and C. R. Crosby; "More about the black widow" being found in Orient, Long Island; "On pinning Odonata"; "You can make this handy beating net" described by W. Proctor of Bar Harbor; "New species" being found by L. L. Pechuman in Bronx, New York; "On shipping insects," about which the writer questions the advisability of completely filling the vials with the preservative, but suggests leaving an air space for expansion and reducing the danger of the contents washing about by forcing in a good wad of cotton, not so far as to damage the specimens; "Bargains of the month."—E. T. CRESSON, JR.

[3] H. C. Fall, Pan-Pacific, Ent., 7, No. 2. p. 74, 1930.
[4] J. N. Knull, ENT. NEWS, 46, p. 189, 1935.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MARCH, 1936.

ENTOMOLOGY AT THE CONVOCATION WEEK MEETINGS, DECEMBER 30, 1935, to JANUARY 4, 1936.

Our annual summary of the entomological items of the programs of the American Association for the Advancement of Science and Associated Societies, held at St. Louis, Missouri, and of the American Society of Zoologists, held at Princeton, New Jersey, follows.

The number of papers bearing on insects including those in symposia and non-duplicating demonstrations, were:

Entomological Society of America	44
American Association of Economic Entomologists	116
*Section F, Zoological Sciences, A.A.A.S. (excluding joint sessions with Amer. Soc. Parasit. and Ecol. Soc. Amer.)	19
American Society of Parasitologists	3
Wilson Ornithological Club	1
American Phytopathological Society	1
Mycological Society of America	1
Ecological Society of America (joint meeting with Section F, A.A.A.S.)	5
Genetics Society of America	12
*Phi Sigma Society	14
Limnological Society of America	1
Section N, Medical Sciences, A.A.A.S.	1
*American Society for Horticultural Science	4
Potato Association of America	1
American Society of Zoologists	16
Total	239

These papers were distributed in subject as follows:

*General Entomology	3	*Anatomy and Morphology	6
Collecting and Rearing Methods	6	Physiology	28
*Entomological Instruction	5	*Ecology	23
Entomological Museums	1	Behavior	1
Cytology	11	Geographical Distribution	6
*Embryology and Life History	19	Genetics	5
		Evolution	1
		*Taxonomy	13
		Parasites and Diseases of Insects	5

General Economic Entomology 11
Insecticides 25
Apiculture 11
Arthropods affecting Man 5
do. do. Other Animals... 2
*do. do. Cereals and Field Crops 21
do. do. Truck Crops.....13
do. do. Households 1
do. do. Ornamental and Greenhouse Plants 2
*do. do. Fruits and Fruit Trees 20
do. do. Forest and Shade Trees 6
*do. do. Miscellaneous Plants 14

ii

*Araneae 5
*Acarina 5
Collembola 1
*Orthoptera 33
Isoptera 1
Ephemerida 2
Odonata 2
Homoptera 15
*Heteroptera 10
*Thysanoptera 3
*Coleoptera (excluding Japanese Beetle) 26
Japanese Beetle 3
Hymenoptera (excluding Honey Bee) 5
Honey Bee 6
Trichoptera 1
Lepidoptera (excluding the three following) 18
Codling Moth 13
Oriental Fruit Moth... 2
*Corn Borer 4
Diptera (excluding *Drosophila*) 17
Drosophila 6

Many of these figures are duplications, both between sections i and ii and also within sections. Increases in numbers of papers over the corresponding figures for 1934 are starred (*). The total number of papers, 239, is the same as we gave for the Pittsburgh meeting (1934).

Both entomological societies met, as last year, in the same hotel (Jefferson). The Entomological Society was presided over by Prof. C. H. Kennedy, Ohio State University; Prof. H. B. Hungerford continued as Secretary and was elected President for 1936. The annual address was delivered by Mr. Curtis P. Clausen, U. S. Bureau of Entomology, on "Insect Parasitism and Biological Control," at the combined entomologists' dinner on December 31, at 8 p. m.

The President of the Economic Entomologists was Mr. L. A. Strong, chief of the U. S. Bureau of Entomology, the Secretary, Mr. A. I. Bourne, Amherst, Massachusetts. The President's address was entitled "Stabilizing Entomology," with the Entomological Society in joint session, December 30, at noon. The symposium, on "Orchard Sanitation," was presided over by Prof. J. J. Davis.

Entomological Literature

COMPILED BY V. S. L. PATE, LAURA S. MACKEY and E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual volume, and in some cases the part, heft, &c. the latter within ( ) follows; then the pagination follows the colon :

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

GENERAL.—Austin & Pitcher.—A laboratory method for rearing Sciara and Phorid flies. [8] 72: 12-15, illus. **Balfour-Browne, F.**—The species problem. [Brit. Assoc. Adv. Sci. Rept.] 1935: 63-78. **Barnes, H. F.**—Recent Advances in Entomology. [Science Prog.] 30: 503-510. **Davies, W. M.**—A water-power mechanical insect trap. [22] 26: 553-557, illus. **Gause, G.**—On the causes of the mass appearance of the insects. [Zool. Jour. Moscow] 14: 413-438. [Russian]. **Jaques, H. E.**—Some methods of labeling and housing large insect collections. [4] 68: 1-7, illus. **Nicholson & Bailey.**—The balance of animal populations. [93] 1935: 551-598, ill. **Smith, H. S.**—The role of biotic factors in the determination of population densities. [12] 28: 873-898, ill. **Welch, P. S.**—Limnology. New York. 471 pp. **Williams & Milne.**—A mechanical insect trap. [22] 26: 543-551, illus. **Woodbury, A. M.**—Animal relationship of Great Salt Lake. [84] 17: 1-8.

ANATOMY, PHYSIOLOGY, ETC.—Ahrens, W.—Monographie des weiblichen Geschlechtsapparates der Termiten (Nach Untersuchung an Termes Redemanni). [Jena Zeitschr. Wissen.] 63: 223-302, illus. **Ancona, L.**—Nota acerca de las celulas lisigenas y fagocitarias de las crisalidas de Aegiale hesperiaris. [112] 6: 193-199, ill. **Badonnel, A.**—Recherches sur l'anatomie des psoques. [Bul. Biol. France et Belg.] Suppl. 18: 241 pp., ill. **Darlington, C. D.**—Sex-

determining mechanism of Drosophila miranda. [90] 70: 74-75. **Gresson, R. A. R.**—The spermatogenesis of Stenophylax stellatus. (Trichoptera). [53] 78: 311-327, ill. **Hanna, A. D.**—The morphology and anatomy of Euchalcidia caryobori. [Bull. Soc. R. Ent. Egypte] 1935: 326-362, ill. **Herms & Wheeler.**—Tick transmission of California relapsing fever. [12] 28: 846-855, ill. **Hingston, R. W. G.**—The meaning of animal color and adornment. London. 411 pp., ill. **Janda V.**—Contribution a l'etude des changements periodiques de la coloration chez Dixippus morosus. [Men. Soc. R. Sc. Boheme] Sci., 1934, XII: 30 pp., ill. **Jeannel, R.**—Homochromie et Mimetisme. [Rev. Francaise d'Ent.] 2: 113-116. **Jue-Sing Hu & Feng.**—The morphological studies on the mouth parts of some Diptera. [Peking Nat. H. Bull] 10: 117-125, ill. **Kaufmann, B. P.**—The chromosomes of Drosophila amanassae. [68] 83: 39. **Kerkis, J.**—Chromosome conjugation in hybrids between Drosophila melanogaster and D. simulans. [90] 70: 81-85. **Kitchel & Hoskins.**—Respiratory ventilation in the cockroach in air, in carbon dioxide and in nicotine atmospheres. [12] 28: 924-933, ill. **Kocian, V.**—Ueber den Einfluss des Elektrizitaetsstromes mit einer hohen Frequenz und Spannung auf die Metamorphose und Sauerstoffverbrauch der Insektenpuppen und -larven. 89 [Abt. Zool.] 56: 1-7, illus. **Komarow, P.**—Beitrage zur kenntnis des polymorphismus der sozialen insekten (Apis mellifera). [Zool. Jour. Moscow] 14: 171-191, ill. [Russ. resumé Germ.] **Kosminsky u. Warschawer.**—Untersuchungen ueber intersexualitat bei Lymantria dispar. [Zool. Jour. Moscow] 14: 271-310; 439-464, ill. [Russ. Res. Germ.] **Mansour, K.**—On the micro-organism-free and the infected Calandra granaria (Curculionidae). [Bull. Soc. R. Ent. Egypte] 1935: 290-307, ill. **Neiswander, R. B.**—The Alimentary Tract of the Oriental Fruit Moth Larva. [43] 35: 434-439, illus. **Peacock & Greenshields.**—Note on the behavior of certain cell inclusions during mitosis in Tenthredinidae. [53] 78: 303-309, ill. **Thomsen, M.**—A comparative study of the development of the Stomoxydinae (especially Haematobia stimulans) with remarks on other coprophagous muscids. [93] 1935: 531-550, ill. **Trimble, C. A.**—The External Morphology of Hydrous triangularis (Coleo: Hydrophilid). [43] 35: 440-450, illus. **Vimmer. V.**—Ueber die Fanoni Pharyngei, Batelli, im Pharynx von Dipterenlarven. [Casopis] 32: 198-202, illus..

ARACHNIDA AND MYRIOPODA.—**Beier, M.**—Einige neue neotropische Pseudoscorpione. 89 [Abt. Syst.]

67: 443-447, illus. **Bonnet, P.**—La longevite chez les Araignees. [25] 40: 272-277. **McGregor, E. A.**—The Texas Citrus Mite, a n. sp. [10] 37: 161-165, illus. **Mello-Leitao.**—Dois novos Mimetidae do Brasil meredional com algumas notas sobre a familia. [15] 7: 323-327, ill. **Mello-Leitao e Arle.**—Consideracoes sobre a ordem Palpigradi, com a descricao de uma n. sp. [15] 7: 339-343, ill. **Viets, K.**—Eine neue Hyadesia (Sarcoptiformes, Acari) von Curacao. 89 Abt. Syst.] 67: 425-428, illus. Halacariden aus Westindien. 89 [Abt. Syst.] 67: 389-424, illus. (*). **Willmann, C.**—Orobatiden von Bonaire und Curaçao. 89 [Abt. Syst.] 67: 429-442, illus. (*).

THE SMALLER ORDERS OF INSECTS.—Alexander, A. E.—Termites in central New York State. [68] 83: 34. **Bailey, S. F.**—A list of the Thysanoptera of California. [55] 11: 163-169. **Borror, D. J.**—New Records of Ohio Dragonflies (Odonata). [43] 35: 451-456. **Moulton, D.**—New California Thysanoptera. [55] 11: 170-174. **Navas, R. P. L.**—Insectos suramericanos. [Rev. Acad. Cien. Madrid] 32: 360-375, ill. (*). **Reynolds, J. M.**—The Nature of Aptery in the Apterygota. [90] 70: 75-80.

ORTHOPTERA.—Chopard, L.—Le phenomene des phases existe-t-il a etat rudimentaire chez certains Orthopteres. [Bull. Soc. Hist. N. Afrique du Nord] 1935: 269-271. **Roubaud, E.**—Recherches experimentales sur le criquet pelerin. [Bul. Soc. Hist. N. Afrique du Nord] 1935: 272-280. **Rubtzov, I. A.**—Phase variation in non-swarming grasshoppers. [22] 26: 499-522, illus. **Salfi, M.**—Ipognatismo ed Oxycefalia negli Ortotteri. [Bol. Z. Union Z. Italia.] 6: 311-315, ill.

HEMIPTERA.—da Costa Lima, A.—Genero Microtomus. (Reduviidae). [15] 7: 315-322, ill. (*S). **Essig, E. O.**—California Aphididae, New Cloudy-veined species. [55] 11: 156-162, illus. **Green, E. E.**—On Three New Species of Ceroplastes from South America (Coccidae). [109] 2: 272-275, illus. **Lange, W. H.**—Notes on Ambrysus mormon (Naucorid). [55] 11: 155. **Michalk, O.**—Zur Morphologie und Ablage der Eier bei den Heteropteren. [11] 1935: 148-175, illus. **Oman, P. W.**—New neotropical empoascan leafhoppers. [91] 26: 34-40, ill. **Pinto e Lent.**—Hemipteros predadores de insectos, provenientes do Brazil e Argentina. Sobre as especies do genero Psammolestes. [15] 7: 277-282; 333-337, ill. (*). **Poisson, R.**—Les Notonectes du groupe

N. lutea. (Notonectidae). [Rev. Francaise d'Ent.] 117-123, ill. **Skablo, J.**—Influence of the intermittent starvation on the development of the larvae of Loxostege sticticalis (Meadow moth) [Zool. Jour. Moscow] 14: 159-170. [Russ. resume Engl.] **Van Duzee, E. P.**—Note on Ptochiomera caeca. [55] 11: 174 (*). A note on Elasmostethus. [55] 11: 177.

LEPIDOPTERA.—Bates, M.—The Satyrid genus Calisto. [Oc. Pap. Boston Soc. Nat. Hist.] 8: 229-248, illus. (S*). Notes on Cuban butterflies. [Mem. Soc. Cuba. Hist. Nat.] 9: 225-228, ill. (*). **Benjamin, F. H.**—Notes on the Lepusculina-Leporina series of Apatela (Phalaenid). [55] 11: 145-155 (*). Notes and New Species (Phalaenidae). [38] 34: 194-210. **Bryk, F.**—Das Tierreich. Lief. 65. Parnassiidae. Subf. Parnassiinae. 790 pp., ill. **Cockayne, E. A.**—Notes on the Life-History of Agrotis ipsilon. [21] 48: 2-4. **Comstock & Dammers.**—Notes on the Life Histories of Three Butterflies and Three Moths from California. [38] 34: 211-225, illus. **Hovanitz, W.**—Notes on some California Butterflies. [55] 11: 190-192. **Hulbirt, E. L.**—Two unusual Butterflies taken in Southern California. [38] 34: 210. **Kuehn, A.**—Versuche ueber die workungs-weise der erbanlagen. [88] 24: 1-10, ill. **Plate, L.**—Genetische und phylogenetische Analyse der Colias-Kreuzungen des Herrn Emil von Silbernagel. [Jena Zeitschr. Wissen.] 63: 197-222, illus. **Schaus, W.**—New Species of Lasciocampidae from Neotropical countries. [75] 17: 47-66. **Schwanwitsch, B. N.**—Symmetry in the wing-pattern of Papilionid butterflies. [9] 69: 7-12, illus. **Spitz, R.**—Revisao das cinco especies do genereo Myelobia. [Rev. Mus. Paulista] 19: 579-594, ill. **Vasquez, L.**—Contribucion al conocimiento de los lepidopteros Mexicanos. Halisidota caryae. [112] 6: 215-244, ill. **Williams, C. B.**—Further evidence for the migration of butterflies. [Bull. Soc. R. Ent. Egypt] 19: 250-261.

DIPTERA.—Austin & Pitcher.—(See under General.) **Castro, G. M. O.**—Estudo sobre uma especie de "Limatus" que se cria em buracos de pau. [Rev. Dept. Nac. Prod. An., Rio de Janeiro] 2: 143-151, illus. (S*). **Evans, A. C.**—Physiological races of Lucilia sericata. [31] 137: 33-34. **Marshall & Staley.**—Generic and subgeneric differences in the mouth-parts of male mosquitos. [22] 26: 531-532, illus. **Philip, C. B.**—The Furcatus Group of Western North American flies of the genus Chrysops (Tabanid). [10] 37: 153-161. (*). **Reinig, W. F.**—Ueber Anomalien des Flue-

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SPECIAL NOTICES.—Les Anophèles de la France et de ses Colonies. Part 1. Par G. Senevet. Encyclopedie Entomologique. XIX. 361 pp. **Snyder, Thomas E.**—Our Enemy, The Termite. Comstock Publ. Co., Ithaca, N. Y. xii + 196 pp., illus.

BUMBLEBEES AND THEIR WAYS, by OTTO EMIL PLATH, Boston University. The MacMillan Company, New York, 1934. pp. XVI, 201, colored frontispiece, 20 text figs., and 10 plates. $4.00. Although bumblebees are among the insects most frequently observed by nature-lovers and beginning students of entomology, they have not received the serious attention deserved by their commonness, interesting communal life and economic importance. Dr. Plath has been one of the few American students of insects in a position and willing to devote the many hours and successive summers necessary for

a study of this character. Since 1922 he has published many papers reporting the results of his studies of the life histories and habits of North American bumblebees, particularly the species of the New England States. His new book is essentially a summary of all his researches to date together with a critical review of the world literature and its interpretation in the light of his own investigations and views.

The main body of the book contains thirteen chapters dealing with such phases of bumblebee life as the development of colonies, interrelations between commensals, parasites and predators, especially interesting or complex habits, the technique of rearing and studying these active and at times pugnacious insects, and ending with a chapter developing a classification based upon behavior. In 1927 the reviewer called attention to the fact that the biological differences existing among bumblebees were such as to confirm in general the species and subgeneric or group concepts which were being proposed in systematic literature upon the basis of morphological characters of adults. The studies of Plath have resulted in many additions and refinements to earlier biological classifications and again may be interpreted as showing the general soundness of present classifications based upon adults.

One feature of this new book of interest and service to many is an Appendix giving a brief summary of the appearance, life history and distribution of thirteen species of *Bombus* (*Bremus*) and four species of *Psithyrus*. The state of our knowledge of the North American bumblebees is partially reflected by the fact that these species, with one or two exceptions, are essentially from central and eastern North America. Maps are given to show the distribution of the species mentioned. Too great a reduction of the original maps has made it difficult in many instances to distinguish the known range from that indicated as probable range. Based upon an accumulation of data over a period of many years the writer cannot agree with some of the ranges indicated as "probable" on the maps.

The writer of this review has been studying bumblebees from one viewpoint or another for twenty-five years and is greatly pleased that we now have available for layman and scientist alike an attractive and authoritative book pertaining to these social insects, written in entertaining and non-technical stlye, well illustrated and excellently printed. "Bumblebees and Their Ways" is a credit to the publisher as well as to its author. —T. H. Frison.

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